

REMARKS

In response to the above Office Action, claims 3 and 7-10 have been cancelled and replaced by new claims 11-16 to more clearly claim the novel and unobvious features of applicants' invention.

New main claim 11 relates to a composite fabric material for use in making an article of clothing comprising a knitted or woven composite fabric material having a top, surface layer when used to make the article of clothing, which top, surface layer has a reduced color change when contacted with water, said composite fabric material being a multi-layered structure of two layers or more, wherein one of the layers is the top, surface layer and is formed with a yarn made from a synthetic fiber that contains from 1% by weight or more to 6% by weight or less of a white pigment and/or a core-sheath composite synthetic fiber comprising a core portion that contains from 3% by weight or more to 15% by weight or less of a white pigment, and a sheath portion containing 2% by weight or less of a white pigment, and the other of the two layers is at least one inner layer, other than the top, surface layer, and is formed with a yarn made from a water-absorbent and water-diffusing fiber.

Support for new claim 11 can be found, for example, in former claim 3, on page 3, lines 7-18 and on page 55, lines 2-9 of the specification. Claims 12-15 correspond to former claims 7-10 respectively. Finally, support for new claim 16 can be found on page 55.

Summary of concept of the present invention as set forth in claim 11

When an article of clothing gets wet from rain or perspiration, the color shade of the cloth tends to deepen in the area of wetted spot and the appearance of the clothing

is temporarily marred. The present invention is based on an idea that surface color shade change of a dyed fabric can be significantly suppressed when the fabric material used to make the clothing is composed of a white pigment containing fiber layer and a water-absorbent and water-diffusing fiber layer in a specific combination. In the claimed composite fabric material structure, a water film on the surface of a fiber containing white pigment in a dyed fabric will be swiftly removed, so that the water at the wet spot within the fabric will be redistributed towards surrounding areas and any color change occurring at the wet spot will be swiftly reduced.

As discussed on page 1, line 14 through page 2, line 5 of the present specification, a fabric formed wholly of fiber containing white pigment cannot prevent a temporal color change occurring at a wet spot formed from water or perspiration. An occurrence of the temporal color shade change at a wet spot within a fabric can be prevented in accordance with the present invention only when the fabric is composed of a fiber containing white pigment in composite with a water-absorbing and water-diffusing fiber. When a fabric structure is formed of a fiber containing white pigment and a water-absorbing and water-diffusing fiber, removal of water partially present over the surface of the fiber containing white pigment in the fabric is accelerated by capillary distribution of water over the surface of the fibers forming the fabric material. As a result, the change in color shade by a temporal uneven presence of water readily becomes undistinguishable (or diminished) from the surrounding surface color shade and so, the color of the wet spot of the fabric is rapidly made indistinguishable.

Summary of the advantageous merits of the present invention

The fabric material of the present invention has a surprisingly advantageous effect on maintaining the spirit or mind of a competitive athlete. When an athlete, for example in tennis, or in a marathon race, is in action, he (or she), wearing an article of clothing made from the composite fabric material according to the invention, can make their outward appearance look fresh regardless of their physical shape, thereby preventing their opponent from knowing his (or her) true level of exhaustion.

Temporal color or transparency change occurring by spurious perspiration or rainwater can thereby be efficiently minimized. Prevention of a see-through appearance as in the event of heavy perspiration in sport or exposure to heavy rain is very much required in women's fashion.

The composite fabric material as well as its function as mentioned above, is now being used commercially in Japan and European countries to make articles of clothing, for examples, tennis wear, golf wear, aerobics wear, swimwear and the like as described in the attached brochure entitled "Aquamiracle."

Dependent claims

The invention of claim 12 is a specific embodiment of claim 11 as it enables a color change to become even more unnoticeable because the water-absorbent and water-diffusing fiber itself hardly changes in color when the fabric gets wet (see page 10, lines 29 to 35 and page 10, line 37 to page 11, line 9).

The invention of claim 13 is a specific embodiment of claim 11, which provides a stretchable composite fabric material.

The invention of claim 14 is a specific embodiment of claim 3 in which the water-absorbent and water-diffusing fiber used to form the composite fabric material has an appropriate specification of water-absorbability and water-diffusibility (see page 8, line 14 to page 9, line 11). In the present invention value X for the water-absorbent and water-diffusing fiber is selected to be greater than that of the white-pigment containing fiber forming the top, surface layer of the material so as to promptly migrate water from the top, surface layer of the fabric to the inner layer (see page 8, line 35 to page 9, line 3).

The invention of claim 15 is a specific embodiment of claim 11 in which the water-absorbent and water-diffusing fiber has a W-shaped cross section. A W-shaped cross section imparts a greater capillary action and water-retaining characteristic, which serves to make the composite fabric material have both anti-color change properties and wearing comfort (see page 10, lines 4 to 25).

The invention of claim 16 relates to an article of clothing made from the composite fabric material of claim 11.

In the Office Action, the Examiner rejected claims 3 and 7-9 under 35 U.S.C. §103(a) for being obvious over Moretz in view of Mouri and claim 10 further in view of Unitika. As noted above, main claim 11 corresponds to claim 3, and claims 12-15 to claims 7-10 respectively.

Moretz disclosed a multi-layered composite fabric material used to make an article of clothing, specifically an undergarment. The composite material has a moisture transport fabric layer 17A intended to be worn on the inside of the undergarment and next to the skin of the wearer made of a synthetic fiber (e.g., a polyester or

polypropylene fiber) and an inner moisture dispersal fabric layer 17B located in spaced-apart relation from the skin during garment wear made of a water-absorbent and water-diffusing fiber (e.g., nylon, cotton, rayon, etc.)

Thus Moretz discloses a multi-layered fabric material having the same two layers as in applicants' invention, but when the fabric is used to make an article of clothing, the layers are reversed. In other words, the layer made of the synthetic fiber equivalent to applicants' "top, surface layer," is on the inside of the composite structure and the layer made of the water-absorbent and water-diffusing fiber is on top of that layer. In contrast, in the present invention, the layer made of the synthetic fiber is the top, surface layer of the fabric material and the layer made of the water-absorbent and water-diffusing fiber is below that layer.

Moreover, and as noted by the Examiner, Moretz does not disclose adding a white pigment to the composite fabric material as required in claim 1..

Mouri discloses adding a titanium oxide such as titanium dioxide, in an amount of from 0.1 to 25% by weight together with an absorbent to fiber as a deodorizable composition. The reference further teaches that such fibers find use in underclothing (column 15, line 58). The Examiner therefore believes that it would be obvious to one skilled in the art to add the composition including the titanium oxide to the liquid transporting and dispersing fibers of the undergarment of Moretz (i.e., both layers 17A and 17B) to enable the fibers to have a deodorizing effect as taught by Mouri.

However, even if it was obvious for a man skilled in the art to make the suggested addition, it must be appreciated that the titanium oxide containing deodorizable composition would not be added to a "top, surface layer" of the composite

fabric material of Moretz, but rather to the inner most layer 17A and/or inner layer 17B of the material. This would be consistent with the suggested combination, because if one wanted to create a deodorizing effect with the titanium oxide composition they would add it to the fibers of the layers closest to the source of the odor, i.e., the layers next to or near the skin of the wearer.

On the other hand, since the purpose of the titanium oxide in the present invention is entirely different as acknowledged in paragraph 9 of the Office Action, namely to reduce color change when the composite fabric material contacts water, it is added, at least to the fibers of the "top, surface layer" of the material.

It is submitted that there is nothing in Moretz or Mouri that would suggest adding the titanium oxide composition to the top, surface layer of the undergarment of Moretz when the motivation for adding it is to create a deodorizing effect. Logically it would be added, if at all, to inner layers consistent with the Examiner's suggestion.

As required by M.P.E.P. §2143, to establish a prima facie case of obviousness, the prior art references when combined "must teach or suggest all of the claim limitations." Neither of Moretz nor Mouri teach or suggest adding titanium oxide to the top, surface layer (i.e., the outer layer) of a composite fabric material as claimed in claim 11 regardless of its purpose. Accordingly the claim cannot be considered obvious over this combination of references.

With respect to dependent claims 12-15, it is submitted these claims are at least patentable for the same reasons expressed above with respect to claim 11.

Regarding claim 16, it is to be particularly noted that the combination of Moretz and Mouri does not disclose nor does the Examiner suggest that it does disclose an

article of clothing formed from a composite fabric material where the "top, surface layer" of the article at least contains the claimed quantity of white pigment. In fact, because the outermost layer 23 of Moretz's article of clothing is composed of micro-fibers (column 5, lines 30-37), according to applicants it is practically impossible to produce micro-fine fibers containing any white pigment. This is because pigment particles of a metal oxide in a micro-fine fiber would make it impossible to produce a staple fiber due to frequent yarn breakage and formation of fluff.

It is believed claims 11-16 are in condition for allowance and such action is therefore requested.

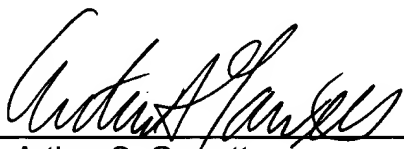
In view of the foregoing amendments and remarks, applicants respectfully request reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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Dated: July 14, 2004

By: 
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Attachments: Brochure entitled "Aquamiracle"